

APPENDIX H
POST PROCESSING ROUTINE

C-----
C PURPOSE: Combine two binary output files from AERMOD or ISC, representing
C current
C impacts and baseline impacts into a single increment impact output file.
C This is
C accomplished by reading the following input files:
C
C 1) A receptor file that represents the receptor set exactly as used in
C the
C AERMOD or ISC modeling for both current and baseline impacts,
C 2) A current impact file that is a binary output file from AERMOD or ISC
C for
C a single averaging period of 1-hour to 24-hours or 1-year representing
C the
C current impacts at receptors in the exact same order as those in the
C receptor and baseline impact file,
C 3) A baseline impact file that is a binary output file from AERMOD or ISC
C for
C a single averaging period of 1-hour to 24-hours or 1-year representing
C the
C current impacts at receptors in the exact same order as those in the
C receptor and current impact file.
C
C The program first reads all of the x and y coordinates from the receptor
C file to
C be used during output of results. This is done because the binary files
C from the
C AERMOD and ISC files does not retain receptor location information from the
C modeling
C that produced those files.
C
C After the receptor information is gathered, the program chronologically
C reads the
C predicted current and baseline impacts from the two binary files for every
C receptor,
C one averaging period at a time. The program performs two read functions for
C a
C single averaging period in gathering the impact results for every receptor,
C reading
C from both the current and baseline files. The baseline result is subtracted
C from
C the current result to determine the net increment impact, which is repeated
C for each
C receptor for the period being processed.
C
C The program keeps track of the highest increment impact and the second
C highest
C increment impact at each receptor as the program works chronologically
C through each
C of the current and baseline files in parallel. The high and second high
C value for
C each receptor are stored in a two dimensional variable with the first
C dimension
C representing what receptor (in sequence) it represents and the second
C dimension
C representing whether it is the high or the second high.
C
C For each receptor and period of the year, the newly calculated increment
C impact
C is compared to the stored highest impact for that receptor. If the new
C increment
C impact is higher than the stored high, then the information for the new
C increment
C impact replaces that for the existing high which is in turn used to replace
C that
C of the existing second high.
C

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C If the new increment impact is not higher than the stored high for that
C receptor,
C then it is compared to the second high for that receptor.  If the increment
C impact
C is higher than the stored second high for the given receptor, then the data
C for
C the new increment impact replaces that for the stored second high
C concentration.
C
C These calculations and comparisons are repeated until every averaging period
C of
C the binary files is processed.  In the end, a high value and a second high
C value
C is stored for every receptor.  An output file is generated showing the
C second high
C concentration, receptor location and elevation, averaging period, source
C group,
C rank and date for each receptor.  The receptor location and elevation are
C obtained
C from the receptor set file processed at the beginning of the program.  It is
C imperative that the order of receptors in the receptor set file be identical
C to that
C used to generate the binary files, both of which must also be the same.  It
C is best
C to use the same receptor file for current impact and baseline impact
C modeling as
C well as for post-processing in this program.
C
C ARGUMENTS:
C   PASSED:
C     File unit 5, current.dat = binary data for current impacts
C     File unit 6, baseline.dat = binary data for baseline impacts
C     conc(i,1) = initialized (-9999) variable for high impact at receptor i
C     conc(i,2) = initialized (-9999) variable for second high impact at
C     receptor i
C     idateh(i) = initialized (-9999) variable for date of high impact at
C     receptor i
C     idate2h(i) = initialized (-9999) variable for date of second high impact
C     at
C     receptor i
C     ir = number of receptors in the receptor file
C
C   RETURNED:
C     ir = number of receptors in the receptor file
C     x(i) = x coordinate of receptor i
C     y(i) = y coordinate of receptor i
C     e(i) = elevation of receptor i
C     srcid = source group identifier
C     conc(i,1) = high impact at receptor i
C     conc(i,2) = second high impact at receptor i
C     idateh(i) = date of high impact at receptor i
C     idate2h(i) = date of second high impact at receptor i
C     istep = averaging period
C
C LIMITATIONS: NONE
C
C I/O:
C   INPUT:
C     File units 1 through 30 binary data impacts
C     File unit 33, receptor.dat = receptor set from the dispersion modeling
C
C   OUTPUT:
C     File unit 31, incremnt.dat = ascii file of increment consumption at each
C     receptor
C
C EXTERNALS: NONE
C

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C (ORIGINALLY WRITTEN BY: Robert J. Hammer)

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C-----
C***  OPEN THE INPUT CONC FILE FOR THE CURRENT PROCESSING YEAR
C
      integer idateh(5000),idate2h(5000)
      real conc(5000,2),x(5000),y(5000),e(5000),factor(30)
      character*8 srcid
      character*12 filenm(30),infile

      open(32,file='getincss.inp',status='old')
      read(32,*)inumfil
      if(inumfil.gt.30) go to 1051
      open(31,file='incremnt.dat',status='new')
      do 10 i101 = 1,inumfil
         read(32,*) filenm(i101),factor(i101)
         print*,filenm(i101),factor(i101)
         infile=filenm(i101)
         open(i101,file=infile,form='unformatted',status='old',
&           err=1050)
         rewind(i101)
10      continue

      read(32,*)inumdays

      infile='receptor.dat'
      open(33,file=infile,status='old',err=1050)

      call getrec(ir,x,y,e)

C      write(*,*) 'Enter number of receptors: '
C      read(*,*) ir

      do 100 i=1,5000
         conc(i,1) = -9999.
         conc(i,2) = -9999.
         idateh(i) = -9999
         idate2h(i) = -9999
100      continue

      do 210 m=1,inumdays

C         print*, ' Entering do 210 m=1,365'

         call getconc(srcid,conc,idateh,idate2h,istep,ir,
+           inumfil,factor)

         if (istep.gt.24) go to 230

         if (istep.le.24) then

C            print*, 'Entering if (istep.le.24) then'
C            print*, ' ISTEP = ',istep

            i1 = istep + 1

            do 220 n=i1,24,istep

C               print*, 'Entering do 220 n=i1,24,istep'

               call getconc(srcid,conc,idateh,idate2h,istep,ir,
+                 inumfil,factor)

220          continue

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        end if
210    continue
230    continue
C      print*, ' ir = ',ir
        do 310 iline=1,6
            write(31,1030)
310    continue

        if(istep.le.24) then
            write(31,1040)
            write(31,1045)
        else
            write(31,1060)
            write(31,1065)
        endif

        do 400 k=1,ir
            if(istep.le.24) then
                write(31,1010) x(k),y(k),conc(k,2),e(k),istep,srcid,
+                               idate2h(k)
            else
                write(31,1020) x(k),y(k),conc(k,1),e(k),srcid,istep
            endif
400    continue

1010    format(3(1X,F13.5),1X,F8.2,I5,'-HR',2X,A8,' 2ND      ',I8)
1020    format(3(1X,F13.5),1X,F8.2,'      0.00 PERIOD ',A8,I10)
1030    format(' ',71X,' ')
1040    format(' *      X      Y      CONC      ZELEV      ',
+            ' AVE      GRP      HIVAL      DATE' )
1045    format(' *      _____      _____      _____      _____      ',
+            ' _____      _____      _____      _____      ')
1060    format(' *      X      Y      CONC      ZELEV      ',
+            ' ZFLAG      AVE      GRP      NUM HRS' )
1065    format(' *      _____      _____      _____      _____      ',
+            ' _____      _____      _____      _____      ')

        goto 999

C***  PROCESS ERROR MESSAGES
C
1050    write(*,*) 'ERROR OPENING INPUT CONC FILE :',infile
        STOP

1051    write(*,*) 'Error: Number of input conc files exceeds 30'
        stop

999    stop
        end

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C
C#####
C      SUBROUTINE GETCONC(s,c,ih,i2h,is,ircps,inf,fac)
C-----
C PURPOSE: Read binary concentration records to get the current and baseline
C impacts
C for each receptor for the averaging period being processed.  For each
C receptor,
C subtract the baseline impact from the current to get the increment impact at
C each
C receptor for the current averaging period.  For each receptor, determine if
C the
C new increment impact is now higher than the recorded high increment impact
C and if
C so then:
C
C 1) Make the second high concentration what was the high concentration
C 2) Make the high concentration the new calculated increment impact.
C
C For each receptor, if the new calculated increment impact is less than the
C present high concentration and more than the second high concentration then:
C
C 1) Make the second high concentration the new calculated increment impact.
C
C For each receptor, if the new calculated increment impact is less than the
C present second high concentration then no changes are made to the present
C high
C or second high concentrations.
C
C ARGUMENTS:
C   PASSED:
C     ircps = number of receptors in the receptor file
C
C
C
C   RETURNED:
C     s = source group identifier
C     c(i,1) = high impact at receptor i
C     c(i,2) = second high impact at receptor i
C     ih(i) = date of high impact at receptor i
C     i2h(i) = date of second high impact at receptor i
C     is = averaging period
C     conca(i) = current impact at receptor i
C     concb(i) = baseline impact at receptor i
C     idate = time and date of present averaging period
C     conctst(i) = calculated increment impact at receptor i
C
C LIMITATIONS: NONE
C
C I/O:
C   INPUT:
C     File units 1 through 30, binary data impacts
C
C   OUTPUT: NONE
C
C EXTERNALS: NONE
C
C (ORIGINALLY WRITTEN BY:  Robert J. Hammer)
C-----
C
      integer ubin,ih(5000),i2h(5000)
      real conca(30,5000),c(5000,2),conctst(5000),fac(30)
      real conctst1(5000)
      character*8 s

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```

C      print*, ' Entering GETCONC'

      do 1010 i102 = 1,inf
        ubin = i102
        call getbin(idate,is,s,conca,ubin,ircps,i102)
1010    continue

C      print*, ' ircps = ',ircps
C      print*, ' is = ',is

      do 1020 j1=1,ircps
        conctst1(j1) = 0.0
1020    continue

      do 300 j=1,ircps
        do 1030 j2 = 1,inf
          conctst(j) = conctst1(j) + (conca(j2,j)*fac(j2))
          conctst1(j) = conctst(j)
1030        continue
          if ((conctst(j).lt.0.00001)
&          .and.(conctst(j).gt.(-0.00001))) then
            conctst(j) = 0.0
          endif

          if (conctst(j).gt.c(j,1)) then

            if (is.le.24) then
              c(j,2) = c(j,1)
              i2h(j) = ih(j)
            end if
            c(j,1) = conctst(j)
            ih(j) = idate

          else if ((conctst(j).gt.c(j,2)).and.
&                (conctst(j).lt.c(j,1)).and.
&                (is.le.24)) then
            c(j,2) = conctst(j)
            i2h(j) = idate

          end if
300      continue

      iyy = (idate-mod(idate,1000000))/1000000
      imm = (idate-iy*1000000-mod(idate,10000))/10000
      idd = (idate-iy*1000000-imm*10000-mod(idate,100))/100
      ihh = idate-iy*1000000-imm*10000-idd*100

      write(*,121) iyy,imm,idd,ihh

121    format(' Reading Binary Year:',i3,' Month:',i3,' Day:',i3,
+           ' Hour:',i3)

C      print*, ' Leaving GETCONC'

      return
      end

C#####
      SUBROUTINE GETBIN(D,H,S,C,U,K,IN)
C-----
C PURPOSE: READ BINARY CONCENTRATION RECORD.
C
C ARGUMENTS:
C   PASSED:
C     U = File unit being read
C     K = number of receptors in the receptor file
C

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C   RETURNED:
C       S = source group identifier
C       H = averaging period
C       C = impact at receptor i
C       D = time and date of present averaging period
C
C LIMITATIONS: NONE
C
C I/O:
C   INPUT: NONE
C   OUTPUT: CONCENTRATION RECORD
C
C EXTERNALS: NONE
C
C (ORIGINALLY WRITTEN BY:   Robert J. Hammer)
C-----
C
C       integer d,h,u
C       real c(30,5000)
C       character*8 s
C
C   print*, ' Entering GETBIN'
C
C       read(u) d,h,s,(c(in,i),i=1,k)
C
C   print*, ' Leaving GETBIN'
C
C
C       return
C       end
C
C#####
C       SUBROUTINE GETREC(jr,xcoord,ycoord,elev)
C-----
C PURPOSE: READ THE RECEPTOR FILE.
C
C ARGUMENTS:
C   PASSED:
C
C
C
C
C   RETURNED:
C       jr = number of receptors in the receptor file
C       xcoord(i) = x coordinate of receptor i
C       ycoord(i) = y coordinate of receptor i
C       elev(i) = elevation of receptor i
C
C LIMITATIONS: NONE
C
C I/O:
C   INPUT:
C       File unit 33, receptor.dat = receptor set from the dispersion modeling
C
C   OUTPUT: NONE
C
C EXTERNALS: NONE
C
C (ORIGINALLY WRITTEN BY:   Robert J. Hammer)
C-----
C
C*** Read the receptor file
C
C       character*80 dataline,data1,data2

```



```
      real xcoord(5000),ycoord(5000),elev(5000)
      rewind(33)
      jr = 0
100    read(33,10,end=999,err=1050) dataline
      write(*,*) dataline
      if((dataline(1:2).eq.'re').or.(dataline(1:2).eq.'RE')) then
          jr = jr + 1
          backspace(33)
          read(33,*,end=999,err=1050)data1,data2,xcoord(jr),ycoord(jr)
+      ,elev(jr)
          write(*,20) xcoord(jr),ycoord(jr),elev(jr)
      else
          go to 100
      endif
      go to 100
10    format(a80)
20    format(3f13.4)
      goto 999

C*** PROCESS ERROR MESSAGES
C
1050 write(*,*)      'READ/WRITE ERROR WITH INPUT FILE :'
      STOP

999  return
      end
```

APPENDIX I
MODELING FILES